

TI 259

Technical Information Surface Protection Linings
Issue 20.12.2019

STEULERFLAKE VSM

Airless-spray applied lining with barrier fillers; High chemical and thermal resistance

Base

Vinyl ester resin

Material Group

Tank-/vessel linings – Flake coatings

Description and use

Mineral flake filled system based on vinyl ester resin with good resistance against high temperatures and aggressive chemicals. Due to its high content of platelet-shaped barrier fillers which align themselves parallel to the substrate, very good diffusion and permeation resistance to water vapour is achieved.

The system has good mechanical and wear resistance.

Suitable for ducts, tanks and chimneys of flue gas desulfurization plants as well as other process plants in various industries.

Properties

- high chemical resistance
- high diffusion resistance
- thermal resistance up to 120 °C (dry exposure), up to 80 °C (wet exposure)

System Design

- Steulerflake Primer VS
- Steulerflake VSM

Nominal thickness is 1.5 mm

Physical Data

Property (unit), Test method	Value
Density [g/cm ³], DIN EN ISO 1183-1, ASTM D 792	1.3
Flexural strength [MPa], DIN EN ISO 178, ASTM C 580	54
Compressive strength [MPa], DIN EN ISO 604, ASTM C 579	45
The thermal coefficient of linear expansion [1/K], ISO 11359-2, ASTM C 531	2.2 x 10 ⁻⁵
Tensile Strength [MPa], DIN EN ISO 527, ASTM C 307	23
Data are mean values	

Chemical Resistance

Good resistance to inorganic acids and mineral oils and other, also oxidizing chemicals.

Please contact our application engineering for approval of the project-specific possible application.

Substrate

Requirements

Processing temperature	approx. 10–25 °C
Dew point distance	> 3 K
Dew point distance from 70% air humidity	> 5 K

Optimal temperature is 20 °C. Higher and lower temperatures influence the processing time and consistency of the compounds and can change consumption, coating thickness and properties.

Steel

Refer to DIN EN 14879-1 as well as to STEULER-KCH-Formsheet 020.

The steel surface shall be sandblasted to a metallic bright finish. A preparation degree of Sa 2 ½ as specified in DIN EN ISO 12944-4 and a roughness grade "medium (G)" as specified in DIN EN ISO 8503-1 must be achieved; minimum surface roughness $R_z = 70 \mu\text{m}$. After blasting, the formation of new rust must be prevented by suitable measures, e. g. priming directly.

The condition of the substrate must be documented by STEULER-KCH-Test-Record 003 (Steel) or STEULER-KCH-Test-Record 004 (Inspection of Grit Blasting Works).

Moisture

During application, the substrate must be kept absolutely dry. Uncured material has to be protected from any kind of moisture (condensation, fog, precipitation or other water source).

Packaging / Shelf life

All components must be stored and transported dry and frost-free. The minimum storage life applies to a storage temperature of 20 °C, unless otherwise specified. Higher temperatures reduce, lower temperatures increase the shelf life.

Components	Item number	Package	Content	Shelf life
Steulerflake-Priming-Solution VS	5032099001	Drum	25 kg	3 Months
Steulerflake VSM	5032131001	Drum	25 kg	3 months
Oxydur-Hardener E	5032016007	Bottle	1 kg	12 Months
Steulerflake-Colour-Paste blue	5011015007	Drum	1 kg	12 Months
Steulerflake-Colour-Paste blue	5011015003	Drum	5 kg	12 Months

** At a storage temperature of 5-10 °C a minimum shelf life of 6 months applies.

For handling, transport and storage observe the relevant material safety data sheets.

Mixing Ratio / Consumption

Steulerflake Primer VS

Component	kg/m²	Part by weight	kg / batch	l / batch
Steulerflake-Priming-Solution VS	0.147	1.000	25.000	22.500
Oxydur-Hardener E	0.003	0.020	0.500	0.500
Total	0.150		25.500	

Total consumption in kg/m² (approx.): 0.150 Work steps 1
Batch creates in m² (approx.): 170

Steulerflake VSM

Component	kg/m ²	Part by weight	kg / batch	l / batch
Steulerflake VSM	0.882	1.000	25.000	20.800
Oxydur-Hardener E	0.018	0.020	0.500	0.500
Total	0.900		25.500	
Steulerflake-Colour-Paste blue*	0.004	0.005	0.125	0.060

* for a color change in every second layer

Consumption per application in kg/m² (approx.): 0.900 Work steps (min.): 2
Nominal layer thickness for 3 coats in mm (approx.) 1.5 Batch creates in m² (approx.): 28.3

Pot Life

Pot life depends on temperature:

Temperature	Pot life
10 °C	approx. 90 minutes
20 °C	approx. 60 minutes
25 °C	approx. 40 minutes

Waiting and curing times

The minimum waiting time until further processing and the maximum waiting time between operations are as follows (approx.):

Temperature	Min. Time	Max. Time
10 °C	8 h	120 h
20 °C	6 h	78 h
30 °C	4 h	24 h

To achieve full chemical resistance 7 days and mechanical resistance 3 days at 20 °C.

Testing

After curing, the coating is tested for leaks with a high voltage tester (eg Elmed inspect 35) under a test voltage of 5 kV per millimeter layer thickness (see TI 379). Max. relative humidity is 70 %.

Safety and Disposal

- sufficient aeration and de-aeration (especially in tanks and pits)
- No smoking / no fire
- Refer to the Safety Data Sheets.
- Observe danger references and safety recommendation labels.
- Wear required personal protective equipment (avoid skin contact with materials).
- Clean and protect hands with skin protective soap and skin protection cream (no solvents).
- Wear a dust mask when sanding (e.g. for repairs).
- Instructions as per § 14 of GefahrstoffV (Toxic Substances Act) and TRGS 507 (Technical regulations for Hazardous Substances - Germany).
- Accident precautions issued by the Liability Insurance Association for the Chemical Industries (Germany).

Do not expose materials to heat or open flame, this applies in particular to welding works (weld beads).

Preferably consume residual quantities. Do not pour into a spout or dustbin! Collect separately for disposal in durable, lockable and labeled containers.

GISCODE

Product	GISCODE
Steulerflake Primer VS	SB-STY 10
Steulerflake VSM	SB-STY 10

Cleaning of Equipment

Tools soiled with uncured materials can be cleaned with STEULER UNIVERSAL CLEANER (Technical Information TI 190). Only clean in well ventilated areas.

Steulerflake-Cleaner A to clean the spray equipment.

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This issue replaces all previous versions.